

A PROCESS FLOW FOR BUILDING MRAM STRUCTURESRelated Applications

5 This application is a divisional application of U.S. Application No. 10/198,194,
filed July 17, 2002, which is hereby incorporated by reference herein, *NOW U.S. Pat. 6,828,639*

Background of the InventionField of the Invention

10 The present invention relates to semiconductor processing technology and, in particular, concerns a device and a fabrication process, whereby a Magnetoresistive Random Access Memory (MRAM) structure can be formed.

Description of the Related Art

15 MRAM is a developing technology that offers the advantages of non-volatile memory with high-density fabrication. An MRAM structure employs the properties of layered magneto-resistive materials, which utilize the spin characteristics of electrons to produce a selective resistance differential across the MRAM structure. Changes in the spin characteristics of magneto-resistive materials result in changes in the resistance of the MRAM structure, and changes in resistance may be sensed thereby permitting the use of layered magneto-resistive materials in logic state devices.

20 MRAM devices typically include a pinned (spin stationary) layer, a soft (spin programmable) layer, and a non-magnetic layer interposed therebetween. The soft or sense layer may be programmed through the application of an external magnetic field and the net magnetization vectors between the programmable layer and the pinned layer may be changed between two discrete quantities, which may then be sensed to detect the programmed logic state of the MRAM device.

25 MRAM devices follow the same high-density fabrication techniques as their semiconductor counterparts. Integrated circuit (IC) fabrication techniques employ sequential steps of layered processing of materials. In one aspect, current